

To Mr. M. Borghese
from the Translator
7805.5.12.

A NEW AND GENERAL
SYSTEM OF MUSIC;
OR,
THE ART OF MUSIC,

Deduced from new and the most simple Principles;

CONTAINING

The THEORY and PRACTICE of the COMPOSITION of MELODY and HARMONY,
of THOROUGH BASS, and of VOCAL and INSTRUMENTAL MUSIC;

By A. D. R. B O R G H E S E.

Translated from the ORIGINAL ITALIAN,

By JOHN GUNN, Author of the THEORY and PRACTICE of FINGERING the VIOLONCELLO.

—Qui turpi fecernis honestum.
HOR.

L O N D O N :

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M,DCC,XC.

To the P U B L I C.

THE Author would have no reason to doubt of the success of this work, if he could be assured of its being read or consulted; but he is not without his fears that it will not meet with that attention; and for this reason:—The infinite number of treatises on Music which have been published, that have promised much, but performed nothing; the unprofitable reading and study which have been thrown away upon them, have so disgusted their readers, that they will be apt to consider the present work among the number. But what has, notwithstanding these fears, prevailed with the Author to hazard the impression, is the approbation the work has received from masters of the greatest merit, who are convinced that it contains every thing that has been hitherto wanting to render the study of this art easy, intelligible, and rational.

P R E F A C E.

SEVERAL reasons have induced me to republish my General System of Music. The former edition is in the French language, I being in Paris at the time of its publication; and with that People it has answered very little purpose. I now correct my error, by presenting it to a Nation who, more accustomed to thinking, will not start at the name of System, and will profit by the useful discoveries I have recently made in the science of Music.

The Public in France, who have not profited by my work, are in this no farther reprehensible, than allowing themselves to be blindly guided by their oracles, the Reviewers, the sovereign arbiters of the fate of literary and scientific productions, from whose decisions there is, in that country, no appeal. The end of their institution, is to spare the public the acquisition, and the useless or dangerous reading of many works which daily make their appearance, and to point out those of genuine merit; but a discerning and enlightened people ought to be guarded against their fallible decisions, and reflect, that sometimes ignorance, sometimes prejudice and party, and often a sordid interest, prevents their taking truth for their guide, and that they thereby fail in their duty to, and mislead the public.

The Reviewers of the French Mercury have given an idea of my System, not only false in itself, but prejudicial to the progress of Science, and of the students and amateurs of Music. They bestow approbation that may flatter the author, while they deprive him of any that relates to the merits of his undertaking: they say, that the fragments of music which are dispersed through the System, appear to be written by the hand of a master; a remark of little moment, and foreign to the end and design of the work: there existed, before these fragments, an infinite number of musical productions superior to them in merit, but there did not exist a System of Music.

There are several ideas, say these Reviewers, to be found in this work, that are entirely new, and that the Author ought to be consulted.—To consult the Author upon ideas which he has submitted to the public, and on an exact science too, is the most novel and unsatisfactory report of a work that ever Reviewers have yet amused the public with; without going into the merits of the System, they have insinuated the inutility of it, by observing that the method of reading and solfaing Music was formerly adopted, but is now discontinued in France: so much the worse: it may be presumed, that this method is nevertheless the best; but, although it were not so, how can this affect the author's system? But it may be observed, that the part of the work here alluded to, is not that exploded method the Reviewers would insinuate; but is new, as well as the use that is to be made of it. The Author recommends to his pupils, to read Music by the first, second, third, &c. of the key, as it opens an easy access to the future reading of any composition in score, to the construction of its harmony, to transposition, to the knowledge of thorough-bass or accompaniment, and to composition; as will be made clearly to appear in the course of the work.

After these frivolous and ill-founded remarks, they proceed to the System itself; but in the very little they say of it there is nothing decisive: and they seem artfully to shrink from pronouncing on its real merits; they only observe, that the principles on which the System is founded were already known; and in this only we are agreed. It was indeed known, that every musical sound whatever was composed of three other sounds; namely, of its octave, twelfth, and seventeenth: but what advantage has there ever been derived from this knowledge? It has remained a curious, but inexplicable and inconsequential phenomenon. Before the celebrated
Newton,



Newton, no one was ignorant that an apple fell from the tree by its gravity; but it was reserved for his superior genius alone to apply that simple doctrine to the other phænomena of nature, and to explain by it the laws of motion of the heavenly bodies. Before the immortal Galileo, it was known, that the motions of a lamp suspended from a fixed point were vibratory, and in the figure of a mixtilinear triangle; he alone however, from the contemplation of this single fact, perfectly inconsequential and useless to every other person, ascertained the law of the vibrations of pendulums, and composed his treatise of spherical trigonometry, &c. Now, because the principles on which their discoveries were founded might have been previously known to others, has there ever appeared any writer of good sense who has dared to dispute the merit of originality to their systems, or indeed to any one, in similar circumstances, who had consecrated his labours to the advancement of science, and to the good of society?

The French Reviewers ought to have examined whether the principles of my System were certain and evident; whether the consequences drawn from them were just and consistent; and whether they were sufficiently extensive for the explanation of every phænomenon, of every operation in Music. That was my undertaking, that was the end I had in view; and such examination ought to have been, if not their only, at least their chief duty: but this is precisely what they have omitted to do; through prudence, shall I say (not being able to penetrate so deeply into its merits), or through design, or perhaps both together?

These Reviewers having thus failed in giving a just criticism, even of the defects of the work, I will myself attempt, however uncommon the task, to supply their omission. My System is chiefly deficient in the same respect with almost every other, on its first appearance; it wants the addition of explanatory Notes, the more clearly to convey its meaning. The Author has a clear view of the several links that form the chain of his System; but they are not all brought forward into the clearest light, and the Reader finds himself in obscurity and embarrassment. I was sensible of this imperfection, in explaining it to a pupil after its publication; and this is an additional inducement to my publishing a Second Edition, wherein these defects will be amply remedied.

Thus far I have conceived it necessary to observe, in defence of my work against the false opinion of the French Reviewers, in order that the Public might not be thereby misled or prejudiced: what follows, will more particularly relate to the work itself.

It is not without reason, that daily complaints are made against the intricacy of Music; but it would be a great error to believe that it is essentially and unavoidably so. Several philosophers have written on the theory of Music; but being entirely ignorant of the art, or at least of several of its parts, and relations between that theory and the practice, they have written without principle, and without having a proper end in view: they have solely endeavoured to fix the proportions of musical instruments, which they have adjusted with mathematical exactness, but still physically wrong, and at variance with practice; for, being obliged to determine them by the effects of instruments, and the combination of these natural bodies being altogether casual, they have taken false relations: besides, with regard to the art itself, they have never learnt to add the harmony to a final cadence, nor to set the bass to a minuet.

Several practical musicians have also taken the trouble of writing; but, instead of a system, there has only issued from their hands a collection of pretended rules, that are at once confused, superfluous, and false, and amount to this: Make such a chord, because it has a good effect; do not make such a chord, because it produces a bad effect; that is to say, compose, execute, but be sure not to reason.

It is matter of astonishment, that an art with so unstable a foundation (the artist thus deprived of the unerring guide of Science) should have notwithstanding arrived so rapidly at that degree of perfection so much admired. What time, labour, courage, and patience, must it not have cost the zealous, the indefatigable artist, to have arrived at it! But how many also do we see, who, despairing of attaining it, have stopped short in their progress, and abandoned their unsuccessful

cessful study, laying the blame on the intricacy of the art! How greatly have they been mistaken! The intricacy, I must repeat it, is not inherent to the art; it is to the bad methods, or rather total want of method in teaching it, that it is alone to be imputed.

If the mathematician had not furnished the artificer with an unerring rule to make a circle or a pentagon, and that he was obliged to make them at hazard; instead of certainty in a few minutes, how many hours would be consumed in unsuccessful attempts! Some, indeed, might succeed; but the greater number would never, or very imperfectly, attain their end.

Disconsolate myself, and wearied by the painful study of music, in every other respect agreeable in its very nature, I have often asked myself, Why has this art, preserved from the ruins of ancient Greece, been transmitted to us from the hands of its philosophers? Not but that it was then, as it is at this day, involved in that mystery and obscurity which occasions its difficulty. But if it had anciently its seat among philosophers, why may it not again resume its former privileges with them? There is no action in nature without a sufficient reason, no effect without its cause. Let us now see, whether a principle may not be found, whence this art derives its origin, which may serve for its foundation and our guide.

With an ardent desire in the pursuit, and by continued observations, I have been able, by slow degrees, at length to penetrate into the arcana of nature, to discover the origin and nature of sound. I have discovered it; but somewhat different, indeed, from what has been imagined. I have examined its beauties, which the human voice and instruments ought to render: I have marked its extent, and discovered its true relation: I have made the analyses of it, and I have found out the qualities which are peculiar to it: I have displayed it in a view, which may be seen with evidence, and every possible clearness: I have, by degrees, developed a chain, wherein every operation of Music will be found.

Afterwards, taking my pupil, as it were, by the hand, and making him ascend and descend, from causes to effects, and from effects to causes, always giving him the reason of every operation in Music, he will find himself, at length, in possession of a threefold method; of Vocal Music, Instrumental Music, and of Composition. How many doubts there are cleared up, and errors confuted, will be seen on perusing the treatise.

The admiration I have ever had for Music, to a degree of enthusiasm, has led me to make these researches and these discoveries. The interest I took in one of my pupils, and friendship, which can only express itself by the medium of sincerity, induced me to commit them to writing; a regard for the progress of science and the public advantage, makes me publish them to the world.

I have found by experience, and I can with certainty declare, that the art and science of Music, treated in this manner, possesses the utmost clearness, and is of the easiest comprehension; that, thus reconciled to reason, it inspires the student with the greatest zeal and most lively pleasure: he, finding himself instructed in the science and theory, may then practise the art without fear or danger of falling into error, or of contracting bad habits: that it will spare him immense trouble, and considerably abridge the period of study; and thereby he will be in a condition of enjoying the fruits of his labour, before he is arrived at an age, when the fire of the passions and of the imagination being extinguished, their productions must lose their lustre and energy.

APRIL 1, 1790.

PART I.

THE THEORY OF MUSIC

C H A P T E R I.

Of Sound, and it's Origin.

TO acquire just notions of the cause of our pleasures, and to trace them to their sources, is no less useful than agreeable; and therefore I shall begin by enquiring into the nature and origin of Sound.

It has almost ever been to chance that we have been indebted for the knowledge of the different properties of bodies which surround us; reason and science have afterwards lent their aid to examine these properties, to calculate their extension, their powers, and have established their just relations. This has been the origin and progress of every true system, and it will be scrupulously adhered to in the present.

Our first step will be to enquire into that body which naturally possesses the faculty of giving Sound. This can be no other than the air: all others, to which the appellation of *sonorous bodies* has been given, invented by art, do nothing but modify the air, in such a manner, as to dispose it to render this property, and to form the quality, and the dimensions of Sound.

To comprehend this truth clearly, a correct idea must be formed, of that fluid with which this globe is surrounded: it introduces itself by means of its extreme subtilty, into the almost infinite pores of natural bodies, even of the most minute; where its powerful elasticity gives movement, and life to every thing. The air, consequently, which surrounds any detached body, preserves a continuity, or communication with the internal air of that body; if it were otherwise, sounds could not pass from one room into another, separated by a wall.

This being premised, let us consider this fluid, 1. As moving in the extension of free space, which is no other than the *wind*; and 2. As passing through the aperture of a door, the opening of a window, or the key-hole of a lock. What happens in these two cases? In the first, if nothing is opposed to its motion, it will not be heard; if it be resisted by any interposing body, which will oblige a part of this fluid mass to change its direction, it will produce an indeterminate noise at most, but which cannot surely enter into the theory of Sound. In the second case, it will render a very distinct whistling, which must undoubtedly be termed a Sound.

Let us now make a few remarks on the different modifications of the air in both cases. In the first, the air runs directly through the free space in one mass; and when obstacles are opposed to its direction, it is only thereby determined into another direction; and in neither of these situations does it produce Sound. In the second, the air suffers a change in its movement from three causes.

1. From the resistance of the interior air, in passing through the aperture. 2. By the precipitation of several particles of air which act at the entrance of the aperture with different velocities; and lastly, by the inequalities of the aperture itself: and it is in this case that the air must have suffered a tremulous motion, which will be communicated to all the parts of which its mass is composed; and by this modification the Sound is rendered. It now remains to enquire, if in this experiment, there may be any other body which may dispute this property with the air: such could only be the aperture itself; but another experiment I made, has proved that it can have no claim to it.

I have applied wax along the sides of the aperture, a non-sonorous and unelastic body, and the whistling has always continued. It is therefore evident that the Sound heard, can only be attributed

to the modified state of the air; and the whistling will become more grave or more acute, according to the increased or diminished diameter of the aperture, which by means of the wax may be done at pleasure.

We may conclude from this experiment, 1. That the air has in itself the property of giving sound, when it is put into an internal tremulous movement by a body of any sort: 2. that sonorous bodies tend only to put the air into this situation: 3. that independent of every other consideration, the gravest or acuteest of sounds are produced, according to the increase, or diminution, of the diameter of the aperture, which alone regulates the degree of it's tremulous motion.

An experiment of this nature, however, which only explains a particular case, would not be a principle sufficient to serve as the basis of a system, if it were not of universal application, that is to say, if it did not account for the generation of sound in every musical instrument.

There can be no doubt of the fact, with respect to wind instruments; no one is ignorant that in these, the hautboy for example, the air is forced through a reed, or in the other instruments, through a mouth-piece, or the aperture of the lips; and that the air is thereby modified as we have mentioned, and the sound produced by these means. It is also known that the aperture is proportioned, by the compression of the reed or lips, to the acuteness of the sound wanted.

In order to form an acute octave on the hautboy, without considering any thing else, it is sufficient to compress the reed; and to obtain the dimensions of the other sounds, it is necessary to admit the degree of the tremulous motion of air proportioned to them. But something more must be premised, before this effect can be comprehended.

The column of air which lies on our lungs, discharged at the will of the artist, by the lungs themselves, is obliged to pass through the reed, where it acquires, as we have observed, a tremulous motion, peculiarly modified. Now, this tremulous air, issuing from the reed, will shock the column of air which was at rest in the body of the hautboy: in which case, according to the laws of motion, the tremulous air will lose as much of its motion, as it communicates to the portion at rest; and consequently the tremulous motion will diminish, in the proportion of it's distance from the reed.

Let us suppose now the seven holes of the hautboy represented by 1, (representing the nearest to the reed, and rendering the acuteest of the sounds,) 2, 3, 4, 5, 6, 7. It is evident, that the trembling of the portion of air, which is at the hole 1, must be more vehement and agitated, than that which is at the hole 2; and so of the others. Now in a retrograde order, when the hole 7 is opened, the gravest sound of the seven progressions will be produced, the sound of the hole 6 will be more acute than that of 7, and graver than that of 5, and so of the rest; and thus the truth of my proposition is evinced, namely, that the dimensions of sound will be, as the vehemence or velocities of the trembling of the air.

Neither must it be imagined that any greater difficulty will be met with, in explaining the generation of sound by stringed instruments, on this principle; as the same theory will account for it, even in strings that are neither touched, or put in motion. If a violoncello is put to a window, that is not altogether shut, its four strings will sound: and it may be thus explained. The external air, by which the strings are surrounded, being in motion, will communicate its impulses to the internal air of the same strings, by the continuity of the external with the internal air, and by continually displacing the latter, will force it to issue from the winding and contorted pores of the strings, which, acting as apertures, there will result a conflict, which produces the tremulous motion, and hence the sound, according to our theory. But it is to be observed however, that if these strings are put in motion, by the action of a bow; their particles, trembling in a stronger degree, will communicate such motion to the internal air, and thence a sound much more sensible will be formed.

The same theory will also account for the dimensions of sound in stringed, as it does in wind instruments. Let us suppose a string stretched on an instrument and rendering a given sound: if the string be afterwards further stretched or relaxed, the sound will become more acute or grave. What is done by the tension or relaxation of a string? Three distinct operations, but altogether having the same effect, and may be substituted one to the other.

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The string will gravitate or press more or less on the instrument; the parts which compose the string will more or less approach to, or recede from each other; or the pores of the string will encrease or diminish; and hence our assertion is always referred to the same principle, namely, that the dimension of the sound, is in proportion to the diameter of the pores or apertures of the string; or, by substituting the latter operation to the first, the dimension of sounds will be proportioned to the gravity or pressure of the strings on the instrument.

From what has been observed, it may be concluded, 1. That the air alone has the property of giving sound, when it is modified by a body, in such a manner, that its parts shall be internally agitated with a tremulous motion. 2. That the instruments, commonly called *sonorous bodies*, do no more than modify the air in the peculiar manner necessary to produce sound. 3. That all sounds more or less acute, are in proportion to the diameters of the apertures, which the air passes through, and to the gravity, or tension of the strings on their respective instruments.

If musical instruments had not hitherto been constructed, all that we have said on the dimensions of sound, would be insufficient; it would be necessary to ascertain the diameter of the apertures of wind instruments, and all the weights necessary for every degree of sound in stringed instruments; but as this work, either by practice or theory, is already done to our hands; what we advance will suffice to throw every necessary light on the subject. It remains to be observed, that the dimension of sound ought not, nor cannot be arbitrarily made; it must be sought after in the bosom of nature herself; and we must there discover what she has proportioned to our senses, to produce on them an agreeable effect. This will be a most necessary enquiry, as all the musical art depends upon it.

It may be seen, that I risk nothing in giving this new hypothesis of the generation of sound. I have given my opinion, because I think it well founded; at least I am unacquainted with a better; and if it should prove to be erroneous, still the effects would remain the same, on the supposition of another cause of the generation of sound; and this remark will suffice to rescue my system from the charge of any imperfection on that account.

C H A P. II.

Of the Origin and the Object of Music.

MANKIND have invented speech for the purpose of communicating their ideas, and to express their passions: but that alone without accent, would have been inadequate to their purpose; it would seldom express the *degree* of passion, and would often render the very *reverse* of the idea meant to be expressed.

Delia is handsome.—Is Delia handsome? Delia is handsome! The words are the same in these three expressions; and notwithstanding this, the first expression declares positively the beauty of Delia; the second, enquires whether she possesses it; and if pronounced in a tone of surprise, makes it doubtful; the third pronounced in a tone of raillery inverts the idea, and intimates that she does not possess any.

Words which, in their literal meaning, are expressive of disrespect and abuse, may, by a varied accent, be taken for expressions of regard and tenderness, or of contempt.

Demosthenes being asked what the most interesting part of the art of an orator was, answered that it was *pronunciation*; that is, *accent* or declamation.

If therefore accent is necessary to the communicating of ideas and to the expression of passions; if it is by means of accent that true and great effects are produced; it must have been therefore necessary to make researches into its nature, to submit it to proper rules, and to a precise order.

What is this accent, or declamation in itself? It is nothing but an inflexion of the voice, with suspensions, and pauses, &c. 1. inflexions more acute, or more grave; 2. more rapid, or more slow; 3. sometimes mournful, sometimes soft, interrupted, articulate, loud; according to the situation of the mind and feelings of the orator. Nothing more than this is *melody*, or the

art of *singing*. *Song*, therefore, will be no more than declamation reduced into an art: and this is what was, or ought to have been its origin, and what has been, or ought to have been its object.

Moreover, although it has been generally believed, that music consists of two distinct parts, namely, of melody, and of harmony; it will be afterwards demonstrated that harmony is not distinct from melody, but is individually the same with it, and that its cooperation is only to make music more perfect.

From all this, therefore, it may be justly inferred that music derives its origin from the necessity of giving a form to accent, and to declamation; and that such is its true and only object.

CHAPTER III.

Of the Extent and Dimensions of Sound.

The first essential enquiry towards the formation of music, will be to discover the extension, and the true dimensions of the voice, in order to determine the inflexions that are suitable and natural to it: these not being, in any respect, arbitrary, it will be necessary to search after them in the very bosom of nature; and the following are the steps which I have taken in the pursuit.

I have observed that when a woman, and two men speak, and declaim the same period, with a similar accent; the only difference that appeared between them, is that the woman expresses herself in a similar inflexion with one of the men, but in an octave more acute, and the second man, in an octave more grave than the first, but that all the three produce exactly the same effect. Nature therefore presents to us in *accent*, no more than the inflexion of a single octave; every extension of voice beyond that, being only a repetition of the same. A fact so well known, and so evident, that it requires no demonstration. Now the greatest difficulty that remains, is to find the natural dimensions of this octave.

An experiment very often repeated, has constantly and invariably shown, that any sound, however grave, heard free of every noise, will, in expiring, be divided into four distinct sounds, namely, the *principal* or generating sound, its *octave*, *twelfth*, and *seventeenth*; and since the truth of this result is generally known and agreed to, it will be needless to relate here, the experiments I myself made to be fully assured of the fact. Every sound therefore which, to our senses, appears *single*, is ever united to three other sounds; its octave, twelfth, and seventeenth; and in this undeniable experiment (useless, and of mere curiosity to all others) I have discovered the principles which will be unfolded in the sequel; the real dimensions of sound, and the whole musical art.

Let us suppose the seven intervals which unite one octave to another to be expressed by A, B, C, D, E, F, G.

To know and to fix the nature of these intervals, I made use of certain tubes or pipes, which are employed in Russia for the performance of music, in a manner no less agreeable than extraordinary. The musicians are provided with a number of wooden pipes of different lengths, each musician taking one, which can only give a single note. Of those who are to play the part of the first violin, for instance, which they do from written notes, each attentively watches every occurrence of the note, which belongs to his pipe, and blows it according to its proper length of time; and in this manner they execute, from beginning to end, the parts of the first violin, second violin, tenor, and bass of any piece of music.

I got one of those who played the bass, and whose pipe gave the note F, to sound that note three different times. I went a few paces from him, that the sound might be perfectly formed, and properly heard; and took with me the three musicians whose pipes gave the acute octave F; the twelfth, or the fifth to the acute octave; and the seventeenth, or third to the double octave; we always heard, together with the principal sound F, the three harmonic sounds above mentioned,

very

very distinctly. I had the further precaution of making one of those with me, sound his acute octave F, very softly, which we found in perfect unison with the harmonic joined by nature to the principal sound. The second time of sounding the principal or generating note, we found the twelfth perfectly in unison with the correspondent harmonic; and the same on the third sounding, as to the seventeenth.

I must here be permitted to make a short digression; a consequence may be drawn from what naturally presents itself. The musical instruments in use in our orchestras are tuned conformably to what nature herself points out by these harmonic or concomitant sounds, and proves the utter fallacy of the pretended temperament. Nature wants no correction of her principles; and men will never attain to any thing perfect, but in searching for her laws, and scrupulously following her precepts.

Let us now return to our subject. I have marked these four united sounds by F, F, C, A: But this one experiment was not sufficient to discover the nature of the seven intervals required: it was therefore necessary to proceed farther, but in a manner as connected as possible. If I repeated the experiment on the acute octave F, it would only produce the same series of concomitant sounds, an octave more acute respectively; the sound A, was too remote from and heterogeneous with its generating sound F; it was therefore most consistent to repeat the experiment with C, 12th of the generating F, being more homogeneous with it than the 17th. The result we found to be, C, C, G, E; and by the same reasoning the experiment repeated with G produced G, G, D, B. And it will be found that these three experiments fill up the extension of the octave, and contain the intervals required.

If we examine these three fundamental sounds, F, C, G, we shall find, that the sound C, is generated by the sound F, and generates G; and consequently that it holds the place of the greatest relation in the series, and ought to be particularly attended to. We shall therefore consider this sound or note, as the centre of this system, or as it is commonly called, the *key*. F, being a note, a fifth graver, and by which C, is generated, we shall denominate the *subdominant*; and G, which is acute fifth to, and generated by C, we shall call the *dominant*. Thus when any note whatever is taken and considered in this double relation, it will stand as the key.

From these experiments, it will be seen, that the dimensions of sound, its progression, melody, harmony, and all the art of music are deduced.

But in order to comprehend it clearly, another experiment will be necessary. Suppose two strings tuned an octave to each other on an instrument; if sound is excited in the graver, the acute octave will vibrate very sensibly, and will also sound. Let the vibration of the graver string be then stopped by keeping a finger on it, and the other string be allowed to continue vibrating; if the finger is afterwards taken away from the graver string, it will resume again its former movement, which will become more sensible if the vibration and sound of the acute string be increased.

It is therefore evident, 1. That every time an acute octave is sounded, the graver octave will also sound, though more feebly: 2. That we do not trespass the order which nature presents to us, in substituting one octave for another; and why should not the effect be natural, if the relations, and proportions continue the same in both cases? Let us now return to our subject.

We have said that our three former experiments produced the three series of intervals, F, f, c, A;—C, c, g, E;—and G, g, D, B. Let the repetitions as distinguished by the small letters, be suppressed, and the acute octaves inverted; there will remain the seven intervals required, a system known by the name of *gamut*, or *diatonic scale*, C, D, E, F, G, A, B=C.

It now remains to enquire into the nature of this progression, and of the degrees of which it is composed.

We have seen by the first experiment, that nature has formed the thirds very acute, being the seventeenth to the generating sound, and among the harmonics it chiefly predominates, and is most distinctly heard; and the two thirds, E generated by C, and B generated by G, must be more acute than any of the other sounds of the progression. Now it is evident that E will approach nearer to F, than F to G; and hence the reason why the intervals from E to F, and from B to C, have been

considered as $\frac{1}{2}$, or *semi-tones*, and the other intervals of the scale, which are equal, as 1, or entire *tones*. If in these proportions there may be any small differences, they are so minute as to escape our senses: and the nature of these intervals, and their progression is here presented to the reader, as it must necessarily be remembered, for the intelligence of our system.

Beginning therefore at C, since we have chosen it for a key in the present instance, we shall find the next degree D, separated from it by the interval of a whole *tone*; D, separated from E likewise by a whole tone, and E from F by a semi-tone; or in other words the fourth degree of the scale is separated from the third, and the octave from the seventh, by a semi-tone; every other degree from each other by a tone.

Now here we have the true extension of sound, its dimensions, and the nature of those dimensions, and consequently of melody; derived from no other source, than what nature herself presents to us, in a simple experiment.

From what has been stated in this chapter, the following inferences may be justly drawn:

1. The natural extension of the voice, which is the instrument of accent, and declamation, is but one octave.

2. This octave is so constituted, that the third note is distant from the fourth, and the seventh from the octave, a semi-tone each, and all the other notes one tone from each other progressively.

3. That computing from the fundamental or key, to the fifth note, from C to E, two consonant intervals or concords are contained in that distance; the first of them, a *greater third*, being composed of two entire tones; and differs in that respect from the second third from E to G, which is composed of a tone and semi-tone, and may therefore be called a *minor third*.

4. The harmonics being of different natures, different names must be given to them; those of the fifth, and of the octave, being more similar and related to the fundamental, we shall call *perfect concords*, and that of the third, being less similar to it, an *imperfect concord*.

5. The first species of concords are therefore unalterable in their nature in every key; but that of the third is liable to an alteration, as will be more clearly seen in its place.

6. Every sound which appears single to our senses, is in fact composed of three other sounds, namely, of the octave, twelfth, and seventeenth; and therefore by inverting the order of these three harmonics, the fundamental will be known.

7. Every harmonic may be inverted, and while they preserve the same relations, the concords will always remain natural.

8. Melody, song, or declamation, is only the arbitrary choice, either in succession, or by large intervals, of the degrees of this progression, or diatonic scale. But this extension may be taken higher or lower; that is, we have made choice of C as fundamental, and we might have equally taken D, which is higher, or B, lower; and the result would have been perfectly the same, and the same theory arise.

9. To change the key therefore, is nothing more than taking any of the seven degrees for a fundamental, and to transpose the diatonic scale as given us by nature, always preserving the same order, and the same relation.

10. Each of the seven notes may thus become third, or seventh of the key; and consequently a semi-tone; and hence the necessity of the notation of music by semi-tones, and the characters of sharps, flats, and naturals. Hence also the construction of musical instruments so as to render these semitonic intervals.

11. Consequently, the scale being composed of five tones and two semi-tones, will consist of twelve semi-tones; every one of which may be assumed as a fundamental, and therefore we shall have twelve natural keys, which are called *major keys*.

12. To establish a key, is no more than to make choice of one of these tones or semi-tones as a fundamental, and to proceed with the other degrees as nature has rendered them, and preserving the relations she has established; that is, a *dominant*, in the fifth above; a *subdominant* in the fifth below the fundamental; and as these two degrees concur in forming the regular progression of the seven degrees, I shall call them *subordinate fundamentals*.

C H A P. IV.

Of the Nature of Harmony.

BEFORE I treat of the nature of harmony, I should wish to put the reader on his guard, against adopting the opinion of those, who pretend that harmony is bad in itself; that it is derived more from art than nature, since it is, say they, naturally displeasing to the ear, confounded on it's first hearing of harmony, and only becomes pleasing by habit and use.

I respect infinitely the talents of the Author * who has advanced this paradox: but we labour to be instructed; experience and reason, not opinion and authority, ought to conduct us in our researches.

I will however grant him, that our senses, struck by the complication of harmony for the first time, may require a certain degree of habit to render it pleasing; and in general, every complicated object, will, in the same circumstances, require it. I will moreover tell him, that it is even always required when our senses, already habituated to a certain motion or modification, after being a considerable time in a state altogether opposite, shall again be struck with the former objects. But after all, how can it be concluded that harmony is but a factitious beauty, and naturally displeasing? With such logic, I might also say that the most delightful landscape that nature has ever presented to us, is a factitious beauty, and naturally displeasing; because the eyes of a man long accustomed to entire darkness, require some degree of habit, before they can bear the shock of the solar rays, which prevent their discovering the beauties of the prospect, and feeling the pleasure that would thence arise. Now, I am persuaded that as such reasoning would be reprobated by the celebrated antagonist of harmony, it ought not to appear surprizing that I should, with more reason, highly condemn his assertion.

But leaving these unsupported notions, let us listen to nature alone, and examine the charms of harmony; and before we attempt a definition let us endeavour to analyse it.

The harmonics of every sound whatever, as we have already remarked, are naturally, and happily hidden; which produces a two-fold and pleasing effect. It is these hidden sounds, in the first place, which form the richness, and resonance of musical sounds: and in the second place, they tacitly point out to us the nature of harmony. It is evident we must attribute the first of these effects to the harmonics: a sound of percussion, such as that of the harpsichord, which expires as soon as it is formed, has a dryness and thinness in it, which makes it but little agreeable in itself. On the contrary a lengthened, *soffenuito* sound, such as that of the violin, is full of beauty and expression. To what is this difference to be attributed? is it not because the former has not had time to form itself, and to render it's harmonics like the latter sound? And hence is to be derived the cause of that richness and mellowness of sound, which makes it's way to the soul.

Now we may draw from what nature exhibits to us, the true origin of harmony. We have seen that the object of music is to awaken, and to express our passions; to imitate, to speak. The grand means which is employed to answer this end, is *melody*; that is the only part of music which has the faculty of imitation. The goodness, and the power of melody, not only depend on the just inflexions of the voice, but also on it's richness or resonance, or which is the same thing, on the formation more or less perfect of it's harmonics, as we have already said. It is therefore evident that we shall attain to this perfection of sound, by adding to each note of the modulation, the harmonics which naturally belong to it; and thus, being reduced to it's just terms, we may define harmony to be nothing more than a *more sensible* representation of the harmonics of sound; and as we have seen that these four combined sounds, form but one aggregate sound; in the same manner, harmony forms one whole, however the different nature of the voices and instruments, producing that effect, may appear to us a combination of different sounds.

* J. J. Rousseau.

We see therefore that it may be confidently asserted, that harmony does not properly make a distinct and separate part of music; being intimately and inseparably united to melody: or it is rather melody itself, rendered more sensible, by giving to it's sounds more energy, and more perfection: and this is the nature, and true idea which we ought to form of harmony.

It remains now only to give to each degree of the scale, the harmonics which naturally belong to it, and as we have derived the notes which form the melody of the scale, from the harmonics of it's key note, of it's *dominant* or fifth, and of it's *subdominant* or fourth; it is evident that in these three fundamentals, we must find the harmonics or concords which are suitable to each note of the melody: and we shall therefore call the key, dominant and subdominant, *harmonic places*; and by them we shall construct the *harmonic scale* or gamut, in the practical part.

From what has been observed in this chapter, the following inferences may be made:

1. That melody is the means employed to answer the chief purposes and object of music.
 2. That it is the harmonics, more or less formed, or heard, which constitute the beauty of sound.
 3. That harmony is only the art of rendering the harmonics more sensible.
 4. That harmony therefore is not distinct from melody, since it does but render it more pleasing.
 5. That harmony, although appearing to our senses, complicated, by the different nature of the voices and instruments producing it; does only in fact represent unity; that is to say, one entire sound, of which melody is formed.
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PART II.

OF THE PRACTICE OF MUSIC.

CHAPTER V.

Of the Composition of Melody.

BEFORE we enter upon the manner of executing music, let us enquire into the laws of its composition. Melody is the sole object of the composer (Infer. 1. Chap. 4.) But by a strange fatality, no writer on the art has ever treated of it!

Melody, like declamation, has its periods, and these again their pauses, rests, suspensions, &c. The composition of melody would be limited to too narrow a space, if it had only the choice of one diatonic progression, out of which to compose it's periods; and there would be an unsupportable monotony, if these were to have only one rest, and one cadence on the fundamental. Let us therefore enquire into the number of keys which music affords; and into those which hold the proper relations, fitted to give a wider extent to the composition of the periods of melody.

We have seen (Infer. 11. Chap. 3.) that the number of keys arising from the experiments made, was twelve. It must be now mentioned that beside these there are twelve *minor keys*; and that these are not, like the former, given us by nature, but are formed by art. Nor do I therefore exceed the limits I had proposed to myself. In any system whatever, founded on principles drawn from experiment, the just consequences that are deducible from them, will equally partake of the force and nature of the principles themselves.

All the writers on music have found themselves embarrassed, when they come to treat of the *minor mode*. Unacquainted with its origin, or with its fundamental or generating sound, they have advanced different opinions, in order to give it a suitable progression and scale; but in recurring to the principles I have before established, every difficulty will vanish.

In what manner has nature constituted the key of C, for instance? By the progression above mentioned (Infer. 2. Chap. 3.) and by the harmonics. Of what do the harmonics of the key of C consist? Of a greater third C E, and of a minor third E G: now it is evident (Infer. 7. Chap. 3.) that if the harmonic E G is inverted into A C, which is precisely of the same dimensions and nature, we shall have the two thirds A C minor, and C E major, which preserve the same relation and the same nature, with the two former C E, and E G, and consequently must equally produce the same natural and pleasing effect. Moreover, if we proceed diatonically from A, to its octave, without altering any of the intervals which fill up that extension, is it not the same progression as is made use of from C to its octave? We repeat individually the very same notes, without any difference. Now, to make use of the same progression, the same harmonics, and relations, or to be in the same key, is not this one and the same thing? Consequently to be in the key of A minor, or that of C major, will be perfectly the same thing: and therefore both are marked in the same manner, without any alteration of sharps or flats on the clef. The whole difference is this, that in the major key, the fundamental is C; and in the minor it is A; and consequently the close or *cadence* in the first case will be on C, and in the second on A. And we may add, that the harmonics in C are both given and *combined* by nature; and in the key of A, they are given by nature, but *combined* by art.

From the great relation subsisting between these two keys they are called *relatives*; and thus every major key has its relative minor; and *vice versa*, every minor key will have its relative major.

It must be observed that in the minor mode, the sixth of the key, must be minor, as will appear from the natural scale; and this leads us to the discovery of another concord, namely that of a *sixth* of every fundamental. In that of C major for instance, we shall have in the harmonics of the key, C E A; that is, a sixth to the *key note*; and therefore every fundamental, principal and subordinate; or key, dominant and subdominant (Infer. 12. Chap. 3.) by the same reasoning, may have a sixth; and this concord is a combination of art.

Let us now come to the source of all the difficulties, and of the controversies between writers on music, as well as artists, concerning the *minor mode*. They say that in this mode, there is no gamut: That artists, in order to make a cadence in A minor, must make G become a sharp seventh: And in this case, they say, that F, should become in like manner a sharp sixth; otherwise that in the diatonic scale in passing from F, to G sharp, an interval would be made, of a tone and semi-tone; and that this progression would not be natural: And I shall also add, that if they made F, and G sharp, the progression of the key A would no longer have any relation to that of the key of C, as it would be in that case a progression altogether different. Now we answer to this two-fold objection; that in the minor scale of A, there is no sharp wanted on F, or G; and if artists make use of either or both, it is only when the notes are rapidly executed, and consequently do not bear harmonics. When they are obliged to put a sharp to the seventh G, of the key A, which bears harmony, it is in the sole case of a cadence being made on A, and therefore the sharp seventh becomes necessary (Inf. 2 Chap. 3). It is true that in passing from F natural to G sharp, the interval is more than diatonic; but melody does not prohibit such larger intervals; neither must it be believed, that in either case, they execute a scale; let them execute the *descending* scale of A, wherein the phrase suffers no interruption, and without any sharp occurring, and they will find it natural; so there is in fact, no difficulty in the case.

From what we have hitherto said, it is evident, that each *major* key has its relative *minor*; and there being twelve major keys, there will be also twelve corresponding minor keys, and therefore the number of keys derived from the progression of the scale, will be twenty-four.

I take it for granted, that the reader is acquainted with the manner of passing from one key to another, or that the young student will learn this of his master; I shall only observe to him, that the different flats and sharps that are made use of for that purpose, do only form the progression

of the scale higher or lower, (Inf. 9 and 10, Chap. 3) preserving the same order and relations that nature has produced in the scale of C; that is, that from the third to the fourth, and from the seventh to the octave, there shall be a semi-tone, and between the other degrees, an entire tone, (Inf. 2, Chap. 3)

Before we begin to treat of the composition of melody, or song; it will be necessary to acquire a knowledge of the phrases, or periods, of which it is composed, where they are to stop, and how many kinds of rests or cadences, any phrase can have.

Every note of the seven, in the diatonic progression, must be an harmonic, since all the seven are only the result or production of one another (and if F the subdominant does not hitherto appear to be produced of any, it will be shewn in the next chapter to be an harmonic of the dominant); and therefore in whatever place a phrase may stop, it will always be on a harmonic; and this will have a different relation, according as it belongs to one or other of the three fundamental, or generating sounds; it will therefore be necessary to give to each a different name, to distinguish it from the others.

Any phrase whatever, in it's beginning, can only have the concords of the key or principal fundamental, for it's constituent parts, but it must necessarily afterwards be characterized by other relative concords, come to an end, and a perceptible rest. If the penultimate, or notes immediately preceding the phrase, are near the key note, as the ninth or the seventh, for instance; we then feel a desire for it's returning or proceeding to the key note; and the seventh in particular will oblige us to do it, being acute, and forming a species of command to the phrase to close in the key, to which it is in the nearest possible situation, and conducts us naturally into it. It is this ending of a phrase, this species of rest, that is called a *cadence*; and it is to be observed, therefore, that the sharp seventh is necessary in all keys, according to the progression of nature, to the forming a cadence on the fundamental. When the phrase terminates on the key note or it's octave, it will be called a *perfect cadence*. (See the plates, No. 7).

When the phrase appears to wander, and fly about the key note, before it terminates in it, we shall call it a *perfect cadence prepared*. (See No. 7).

When the penultimate note of the phrase is on the ninth of the fundamental, it is called a *direct cadence*. (See No. 7).

When the penultimate note of the phrase is on the seventh of the fundamental, is called an *inverted cadence*. (No. 7).

If the phrase rests either on the fifth, or third of the key, we shall call it, an *imperfect cadence*. (No. 7).

If it terminates on a harmonic of the dominant, it is called a *semi-cadence*. (No. 7).

When it ends on a harmonic of the subdominant, it is called a *suspended cadence*. (No. 7).

When the phrase, instead of terminating on the key, prepares another relative key, it is called an *interrupted cadence*. (No. 7).

Now that we have all the materials of melody, we shall be able to treat of it's composition. Music, like oratory, has therefore it's phrases, it's periods, of which discourse is composed; and as these ought always in the latter to maintain a relation to each other, and to the subject proposed to be treated of; in like manner, it is necessary with respect to the phrases and periods in music. Let us now see, among the twenty-four given keys, which of them preserve a relation to one another, in order to fix the path, and the natural extension of melody.

There can be no doubt, that the keys of the dominant, and subdominant, and the relative minor, maintain the strictest possible relation, with the principal key. The relative has the same progression, and the very same harmonics; and the two first, generate each other reciprocally. These two major keys again, have their respective relative minor keys; and there are therefore six keys, three major and three minor, from which the most homogeneous phrases of air or melody may be taken. These phrases, in whatever key they may be found, may have the same number of suspensions, and cadences, that are above enumerated; because each of the six keys being prepared, may

may become fundamental. This extension of the progression of melody, I shall call the *direct path*, because there exists another, from which it is different.

We have already observed, that by varying the order of the harmonics, the key does not vary; that is to say, that the key of C, will remain such, if in place of having the first third *major*, and the second *minor*, it should have on the contrary, the first third *minor*, and the second *major*, the fifth and the octave always remaining the same. (Inf. 2, Ch. 3.) Now the key of C becoming minor, it is evident, that it may pass into its relative major, and thence into its dominant, subdominant, &c. This latter path which presents itself for the extension of melody, being remote from the former we shall call the *indirect path*; but of this we must make a more sparing use, on account of its leading us too far from the original fundamental, and the too great precipitation of the melody, that would be necessary to return into it.

Let us now see the application of all that we have said.—The composer will propose to himself a *subject*, expressive of the matter and object he is to treat; (the beauty and aptness of it, will depend on his genius.) The first notes of the phrase of the subject, must be taken from the harmonics of the key, which we have determined, for example, to be in C. (See the *solfeccio*, No. 1, where the phrases are numbered, and the beginning of each, marked with a star). It is self-evident, that the nature of the key cannot be heard, but in taking the first phrases from its harmonics. The first phrase, it is to be observed, consists of three bars; that is, of an unequal number; all the other subsequent phrases, must therefore be composed of a like number of bars, or multiples of that number: When this exactness is neglected, as it very frequently happens; the mind of the hearer is distracted, and must be dissatisfied with that species of halting or lameness in the air; a case but too common in melodies, without the cause being sufficiently apprehended. Such phrases may be beautiful and pleasing in themselves; but will be wanting in effect, on account of their construction being void of affinity. I am sensible, that this exactness will diminish the number of ideas, and render composition more arduous; but it is nevertheless essentially necessary.

All the liberty that can be taken by the composer in this respect, will be found in the fifth and sixth phrases of No. 1: in the fifth phrase, it is to be observed, the first quarter of the third bar, terminates the phrase, and at the same time, begins the next: and the phrases being linked in this manner, so that the third bar of the fifth phrase is at the same time, the first bar of the sixth phrase, they are not both marked with the star.

Let us return to the progression of the *subject*, or to the choice of keys into which it is to be extended. In the *solfeccio* No. 1, the subject remains in the fundamental key of C, until the end of the third phrase inclusive: In the fourth phrase, it begins to prepare the progression of the dominant G, by means of the sharp on the fourth of the key: I say to *prepare*, because, so long as the phrase does not make a cadence in G, making D, its dominant, to be heard; the key is not determined.

We must now look over the phrases, and discover into what keys we are entered. We shall see, that the fourth phrase not only prepares, but is actually got into the key of G, the dominant, which, in this case, is become fundamental, since the remaining part of the phrase does not go out of the key of G; and there is at length a *perfect cadence* made (See the 5, 6, 7, 8, 9, and 10th phrases).

The first bar of the third phrase will appear to go into A, the relative of C, but in fact, it does only make a very small excursion there; if it had actually gone into the key, it would have made a cadence in it, and this does not appear in the progress of the phrase.

The *subject* is again repeated in G, in the eleventh phrase; and this ought to be generally practised, as it is done to express the object that is undertaken, and to intimate that the subject is adhered to.

In the second bar, the phrase seems to return into the key of C, taking off, by affixing the natural to F, the progression of G; but instead of falling into C, it prepares, by the sharp on G, the key of the relative minor A, and actually goes into it, as is shewn by the 12th and 13th phrases, the latter making a *perfect cadence* in A.

We

We have said that to be in A *minor*, or in C, it's relative major, is the same thing; therefore, without the necessity of preparing its progression, we may return into it; and accordingly it does return into it, as may be seen in the 14th phrase, which repeats the *subject* proposed. The fourth quarter of the third bar of the same phrase, prepares the subdominant F, by the flat on B; and not only prepares the key of F, but afterwards establishes it, by the *perfect cadence* (See the 19th phrase.) In this key the *subject* is also repeated by the 20th phrase, and the 21st prepares the key of the dominant G, but is only a short diversion or excursion; because the third quarter of the third bar of the same phrase, suddenly changes the progression of G, by the *natural* on F, and re-establishes the key of C, and all the remaining phrases circulate about, and return into the original key.

Let us now consider the next solfeggio, No. 2. The first eight phrases pass, in the usual manner, from the fundamental D, to the dominant A; and the ninth phrase returns again into the key D; but it is to be observed that it becomes minor, and then passes into it's relative major F, in the same phrase; and the 12th phrase goes into the original key; and this will give some idea of the *indirect path*. It is further to be observed, that the same phrase by means of the sharp on D, prepares the key of E minor, which is the relative of the subdominant, and establishes that key by the cadence of the 13th phrase. It then takes again the usual progression, as we have seen in the preceding solfeggio,

We have hitherto pointed out what is nearly the extension of song, in what manner the phrases of melody are connected, and whence they are taken. Let us now endeavour to distinguish the *rests* of these *solfeggi*, and the cadence of the periods of which they are composed.

The first phrase of the first *solfeggio* terminates and rests on B, which is an harmonic of the dominant, and it is therefore a *semi-cadence*, according to the definition of the cadences before given. The second phrase terminates in E, which is an harmonic of the key, and is an *imperfect cadence*; because it is on the third of the key. The third phrase ends in C, the fundamental; therefore an *inverted perfect cadence*. The fourth phrase terminates in G, the *harmonic dominant*; and is therefore a *semi-cadence*; at least, as long as the key shall be undetermined. The first quarter of the third bar of the seventh phrase rests on A, and as the key of the dominant G appears to be determined, and consequently must be considered as the key, A becomes an harmonic of D, dominant of G, and consequently will form a *semi-cadence*. Of the same nature is the cadence of the eighth phrase.

The first quarter of the third bar of the ninth phrase falls in E, harmonic of C, subdominant of G; and is therefore a *suspended cadence*. The tenth phrase is a *perfect cadence*, because it terminates in G, the key; and it is *direct*, because the note which precedes it, is immediately above the key, and the harmonics are not inverted.

I omit speaking of the other cadences, which compose the remaining part of the solfeggio, as it would only be a repetition of what has been said. And this is *nearly* the extent of the cadences; I say *nearly*, because the entire knowledge of it will be communicated when we come to treat of *practical harmony*. We have already seen that harmony not only gives perfection to sound, but also that the harmonics of which it is composed, determine it's true place; and for that reason, it will throw the clearest light on the system of cadences, as will be seen in the next Chapter.

Let us now recapitulate all that we have said respecting the progression and extent that can be given to the phrases of which song or melody is composed. The phrases may be derived from the key of C, because it is the original key. They may be taken from the minor of D, because it is the relative of the subdominant F. They may be taken from the minor of E, because it is the relative of the dominant. They may be taken from F, because it is the subdominant: from G, because it is the dominant: from A minor, because it is the relative of the key C: but they cannot be taken from the key of B, because this has not a perfect fifth, as nature requires in the progression of a key (Inf. 5. Ch. 3.) And if a sharp were put on F, to make it a perfect fifth to B, this would exceed the limits of the path of C, there being no F sharp in it's natural progression.

This is nearly what I have to say on the subject of composition of melody. I say *nearly*, because it is not possible to point out all the *minutiae*, and resources of the art. A treatise can only contain the general and fundamental rules, clearly and sufficiently explained. A master of the oratorical art,

art, after having given the rules, and illustrated the principles of it, recommends to his pupil, a classical author, to study, to imitate; and to observe the practical resources which art can draw from science; and I would, in like manner, recommend to my reader to follow the same salutary counsel.

After the melody shall have been composed, it will then remain to know the manner of giving to it its last perfection; that is, to unite to each note of the melody, its proper harmonics, and this will be the subject of the following chapter.

C H A P. VII.

Of the Composition of Harmony.

HARMONY, is the art of rendering the natural harmonics of every sound of the melody, more sensible, in order to give it more richness and beauty. As we have derived all the sounds of which melody is composed, from the harmonics of the key, its dominant, and subdominant; it is evident, that in these three fundamentals we ought to find, the harmonics or chords, which are suitable to each sound of the melody.

We shall now proceed to the examination of what is advanced. The three chords No. 9, not only belong to the key note, since they are all the same thing, but they also point out, the chords of the three upper harmonics, C, E, G. In the same manner, the three positions of the chord of the subdominant, give the harmonics of F, A, C, and those of the dominant G, give the harmonics of G, B, D. Therefore in these three harmonic places are to be found all the chords that are suitable to every note of the scale. These chords are all of the same nature, namely 3, 5, 8. But before we finally sum up these chords, let us see whether any other harmonic will find a place among them.

The celebrated Tartini, pretends to have heard a minor seventh, among the harmonics that are rendered by a sound.

In the analysis of sound, I have before given, no mention has been made of such a seventh; because the extension and degrees of an octave being then the only object of enquiry, the harmonics hitherto mentioned were sufficient to answer that purpose. But it is now necessary that we should investigate every beauty that nature has furnished to enrich her sounds; and to discover any other latent harmonic that may concur in their formation, if any such is to be found.

The authority of so great a name as Tartini, is highly deserving of consideration, although it is insufficient to constitute a proof. In physics, and philosophy, an experiment made by one man alone will not be considered as sufficient, before it is confirmed by repeated experiments made by others, all giving the same result; or it must be sufficiently supported by reason and by truths previously established.

I therefore considered the examination of this seventh, as deserving of my greatest attention; and with that view, I repeated the experiment of the harmonics, in presence of several persons, and the results were as follow.

When the harmonics were on the point of expiring, we all seemed to hear a seventh, but it was so weak, that we remained undetermined, whether it was a new harmonic produced by the generating sound, or only a weak prolongation of the octave. But I observed to the by-standers, that neither the third or fifth were distinguished by such a circumstance; why should it then be attendant on the octave alone? This reflection made us lean to the opinion that it was a seventh; but the experiment was not sufficiently clear, and reason offered nothing in support of any conclusion.

I had remarked, in the course of this experiment, that this faint and languishing octave; or this true seventh, on ceasing to be audible, seemed to leave the mind astonished, undecided, and dissatisfied, and tending to transport it into a new progression. This reflection induced me to make the experiment in a different manner. I caused the fundamental C, to be sounded, and before its har-

monics were expired, I caused the sound of G, the dominant, to be given; and then the seventh, not of the key, but of the dominant, was more distinctly heard, than in the first experiment; and the second, entirely dissipated our doubts, in making us feel the necessity of returning to the key; to the progression whereof it recalled us in the most decided manner; and it could not be otherwise.

It must have been remarked, in the formation and transposition of the scales, that in general, we pass from the key to it's dominant by a sharp on the fourth, and from the key to the subdominant by a flat on the seventh. Hence we may see that in the first experiment on the key, that flat seventh prepared us for the key of F. It was not therefore without reason that it neither was sufficiently sensible, for us to be able to characterize it, nor sufficiently agreeable, to make us place it among the harmonics of the key. The second experiment must have produced a different effect. The first chords or harmonics given by the key, acted on our senses with a powerful energy, because they made the first impression and established the key. Besides, F, the flat seventh of the dominant, is in the scale of C, and did not appear strange to us; we must have known and felt it more distinctly; it must have appeared pleasing and natural; and is it not that note which determines the mode of the key C?

Reason also comes in to support the experiment, in order to establish the propriety of this seventh among the harmonics. Nature has made us feel the thirds to be pleasing; now is not this seventh one of the three successive thirds that we find between G, and it's octave? Why should it not then produce an agreeable effect, conforming to the experiment? I shall further add, that during the time that the harmonics of G are heard, the mode remains undetermined; we do not know whether we are in G dominant, or in C the key, while the flat seventh F, does not come to announce the progression of C, and to render the return into it necessary, and make a cadence in C. And this is precisely what is done in practice, and the use that ought to be made of the flat seventh, in order to obtain from it a good effect,

We may now rectify the erroneous notion that has been formed of this seventh. When it is said that the analysis of sound gives it's flat seventh, the idea is not just, because this seventh, not occurring in the scale of the key, cannot belong to it: but when it is said that every dominant of a key, contains a flat seventh, the idea is just; because it is conformable to experiment, and to the nature of the diatonic scale.

Now that we have determined all the harmonics, we may proceed to sum up the whole, in the harmonical gammut (No. 11.) There it will be seen that every chord belongs to one or other of the three *harmonic places*.

We shall call C the first note of the key, D the second; and we shall say that the first of the key gives 3, 5, 8, and that this chord belongs to the key note, *first harmonic place*.

The second of the key gives, 3, 4, 6, and belongs to the dominant, *second harmonic place*.

The third gives 6, 3, 6, and belongs to the key, or *first harmonic place*.

The fourth gives 6, 3, 5, and belongs to the subdominant, or *third harmonic place*.

The fifth gives 5, 8, 3, and belongs to the dominant, or *second harmonic place*.

The sixth gives 3, 6, 3, and belongs to the subdominant, or *third harmonic place*.

The seventh gives 5, 6, 3, and belongs to the dominant, or *second harmonic place*.

In the *descending* scale, the manner of entering into the key of G, and of going out of it, is shewn.

The seventh, in the descending scale, gives 3, 6, 3, and belongs to the dominant, or *second harmonic place*, (the sixth is used, because as it is wanted to go into the dominant, it is proper that it should be heard).

The sixth gives 4, 6, 3, and belongs to the dominant, or *second harmonic place*; with respect to the key we want to go into, the sixth is major, because it prepares the key of G, by forming it's progression.

The fifth gives 5, 8, 3, and belongs to the key of G, which on this occasion is the *first harmonic place*.

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The fourth is minor, and gives us 6, 2, 4; it belongs to the dominant of C, or second *harmonic place*. A natural is put to F, in order to get into the key that had been quitted, by changing the progression of G, and resuming that of C.

The other three degrees of the gammut continue as in the ascending scale.

Thus we find every possible chord, in the three *harmonic places*, and by them the natural identity of all is to be explained.

If therefore all these chords do but constantly represent the same thing; if they always maintain the same relations; why multiply their denominations unnecessarily; and make a duty of saying a great deal about them, without being able to convince?

If I am unwilling to introduce a change in the terms, however false, because they have been long adopted in music; I shall, at least, give to the student of my method, so just and clear an idea of the chords, that he may discover, at one glance, what they really are.

By the term *bass*, besides the part intended for the voice, is generally understood, the lowest of several parts, of which a piece of music may be composed. This *bass* either takes the key-note, dominant, or subdominant, or one or other of the harmonics of these fundamentals. In the first case, it must be considered as fundamental, and in the second, as making a part of the chords themselves. The *bass* for example, passing from the key to the third, will still preserve the idea of the key; and the resonance of it's sixth C, on the key note as it's octave, and all the harmonic body, will confirm that idea; and therefore it may be considered as depending on, or the representative of the fundamental: now in this, as well as in all similar cases, why should we refer the chord to this *bass*, which is itself but one of the concords or harmonics of the fundamental. This false practice, universally adopted, has introduced into the art of music, a multiplicity of terms and ideas, no less useless, than embarrassing and erroneous. By this means, a cloud of chords which nature disowns and proscribes; sixths, fourths, seconds, false fifths, sharp sevenths, and tritones; have been endeavoured to be brought into existence, but which are in fact nothing more than musical phantoms.

Let us adhere to the simplicity of our principles, and rectify these false ideas. When the *bass*, ceasing to be fundamental, becomes one of it's concords or harmonics, we must observe, that among these concordant sounds, there does always exist one, which represents, by the force of it's resonance, either the key, it's dominant, or subdominant. Let us then say, such a concord belongs to the key; such a one belongs to the dominant; and such another to the subdominant; and then we shall have just relations; our ideas, and our expressions, will be true and precise; we shall constantly find in these three *harmonic places*, all the chords which nature affords, and nothing more; that is to say, we shall only find perfect octaves, *perfect* fifths, major thirds, minor sevenths, and minor sixths, which are only thirds inverted.

Let us for instance turn back to the second of the key in the harmonic gammut; we shall find it's concords expressed by the figures 3, 4, 6; but that expression is false; because experience has never given us fourths, or major sixths; let us then rectify it thus. These concords or harmonics represent the dominant G: let us then suppose it's existence, as dictated by reason. What will be the figures of these concords then in this case? No other than, 3, 5, 8, 7 minor, being what nature and experiment furnish. Let us in the same manner examine the other chords of the scale, and we shall constantly find them reducible to 3, 5, 8; on the dominant alone, the flat seventh, and on the fundamentals, the minor sixth at pleasure; but nothing more. This is the just and only idea we ought to have of the chords.

At No. 13, will be seen the harmonic scale of the minor key: it will be found subject to the same laws that govern the major scale; and it cannot possibly be otherwise, according to the theory already given, of the formation of the minor mode or key.

At No. 12, will be found another harmonic scale: this points out nearly the true place of the chords; since it is not only necessary to know that the first of the key, bears such concords, and the second such others; but it is further necessary to know the true place that is suitable to every one in particular. The following will serve as a general rule to that effect, which will be found observed in this scale.

As melody cannot be good if it be not imitative, and if the phrase be not expressive of something; in like manner the harmony must partake of the same nature. The composer must therefore constantly have in view; first; that each separate part of the harmony have an air or song, and a phrase in itself, as if it were detached from, and unconnected with the other parts. Secondly; that neither the octaves, nor fifths proceed progressively either in ascending or descending; and for this reason. They are called perfect concords, because they form in themselves an unity, as it were perfectly identified. Now it is clear that in passing successively higher or lower, in a mass, they will form a passage entirely uniform, void of variety, in respect of harmony, and must fail in effect and injure the melody. But we must now enquire into the manner of avoiding this inconvenience in practice.

Let us take, for that purpose, the first harmonic scale, No. 4. On the first of the key C, we have at both extremities C, and C, and in the middle of the harmony, G, fifth to C; the bass then ascends into D; I say that the fifth, and the octave, must either remain in their places, as is the case with the fifth G; or proceed in a contrary direction, as C the octave is made to do, which descends on B. In the same manner, when the bass happens to be upon the subdominant F. the acute part is the fifth C; and consequently when the bass rises from F, to G, we ought not to make the fifth rise from C to D, but must resolve it, by an opposite motion, in making it descend on B.

This is as much as can be said in general concerning the natural chords, and the manner of making use of them. There is however besides these natural chords, another dissonant chord most ingeniously introduced by art into music.

Dissonance has never been perfectly defined, and therefore it is that we have never had a clear idea of it, and that authors have given very confused, but tedious accounts of this species of chord. We shall now see that by means of a just definition, every thing concerning them will be as clear as it is concise.

A consonant chord, on a fundamental, that does not belong to it, and consequently has not been generated by it, is together with such fundamental, called a dissonant chord. (see No. 15)

This sort of disorder or disagreement, can, and ought to be removed, or resolved, as it is termed in music, and made to be agreeable, either by making the chords or harmonics, pass on the fundamental that they properly belong to, or the fundamental on the chords. An example will be found in the second quarter of the first bar of the same example, No. 19. where B G is a chord belonging to the dominant, and the fundamental is C, the key. To resolve this dissonant chord, we make B G pass into A F, where it becomes a chord of the subdominant. Let us proceed further. In the two first quarters of the second bar, B, F, D, are the chords of the dominant, having the key C for their fundamental, and they are resolved, by making them pass into C, G, E, the perfect chord of the key. The first quarter of the third bar D, F, C, is a chord of the dominant, with the key; that is to say D, F, belong to the dominant, and C, to the key; it is resolved by making C descend into B, which also belongs to the dominant, and the bass also moves into its place: and this is in general what may be said concerning dissonances, or discords.

It would seem that these dissonant chords go into a wide field: But we shall, in the practice of composition, see very plainly, that the greatest part of them are only a suspension or delay of the harmony, artfully imagined, to make it more eagerly desired, or not to pass too precipitately from one harmony to another.

Musicians have very judiciously introduced these dissonant chords into music. They have been sensible, that by keeping the organs, and the mind, too long in the same modification, the consonant harmonics would become insipid, and tiresome from their uniformity. The dissonant harmonics therefore produce the same effect in music, that shade does in painting; the latter banishes uniformity, and sets off the colours, as the dissonances vary the sameness of musical sounds by giving relief to the consonances.

The practice of making all the parts proceed for a few bars in unisons and octaves, produces nearly the same effect: the invention is judicious; octaves and unisons not forming harmony, but melody merely; a passage of this nature prepares with wonderful success, an interesting harmonic phrase: and the effect it is to produce, may pretty nearly point out to us the circumstances in which it may be used?

In treating of the composition of melody, we traced out the limits and manner of it's modulation: it now remains to see how each of the notes of it's phrases, are to be perfected by harmony. Of this I have given an example in No. 14, being a chain of the keys, at least nearly, into which air or melody may modulate, together with the harmony suitable to it.

This however alone would be too mechanical, and insufficient for forming a just and clear idea of harmony. It is not only necessary to *see*, but it is also necessary to reason; to know why, and in what manner, one harmony is to be preferred to another.

To arrive at this knowledge with certainty, we must apprise the learner that any note of the scale, of which melody is composed, may belong to different *harmonic places*; and it will therefore be necessary to make a further analysis of them, that the young composer may know the extent of harmony, and thence make choice of such as his genius, and the circumstances of the case, may require, to give beauty and variety to the composition.

Let us first examine, to what chords, the several intervals or notes of any key may belong; of that of C, for example. We shall find that the octave C, may belong to the first *harmonic place*, as octave; to the third harmonic place, as *fifth*; to the relative key A, as third; and to D, the dominant of the dominant G, as seventh.

The fifth G, may belong to the first *harmonic place*, as it's fifth, to the second harmonic place as fundamental; to the key of E minor, relative of G, as third; to A, dominant of the relative D minor, as seventh.

The third E, may belong to the first *harmonic place*, as third; to the key of A, the relative minor, as fifth, to the key of E minor, relative of G, as octave; to A, dominant of D minor, as fifth; to E dominant of A minor, as octave; and to G dominant, as sixth.

The sixth A, may belong to the first *harmonic place*, as sixth; to the subdominant, as third; to A, the relative minor, as octave; to D, the dominant of the dominant G, as fifth; to A dominant of D minor, as octave; and to B, dominant of E minor, as seventh.

The second D, may belong to the dominant, as fifth; to D minor, the relative of the subdominant, as octave; to the subdominant, as sixth; and to E, the dominant of A minor, as seventh.

The fourth F, may belong to the subdominant, as eighth; to the second harmonic place, as flat seventh; and to the relative minor of D, as third.

The seventh B, may belong to the dominant, as third; to the relative minor E, as fifth; and to B, dominant of the relative E, as octave.

Particular attention must be paid to these different relations, in order to render them familiar; and by this means it will be easy to find a bass, and proper chords, to any given melody whatever, and with variety. See the practice in the first solfeggio, No. 1.

The first and second bar of the air, are clearly discovered to be taken from the harmonics of the key note, and the upper accompaniments ought to be so in like manner, as it is by them that the melody is to be perfected. The bass is broken into smaller divisions; it might have assumed any of the harmonics, at the pleasure of the composer; but I have made choice of the fundamental, and third, as these were wanting in the upper harmonics.

The third bar has B, which belongs to the dominant; the upper chords made choice of, are G B, and the under, D F; because these four constitute the *perfect harmonic body* of the dominant. But here it is to be observed, 1. That the four notes of the first quarter of the bar, form one group or aggregate, in which the first note B, is only to be considered; the other three being merely *passing notes*, to render the air more graceful; and in this manner we ought to reason on every quarter of a bar in similar cases. 2. It ought to be observed with great attention, that before entering into this third bar, we have on the quarter which immediately precedes it, the fifth G, and the octave C; and therefore it was necessary to avoid both the fifth and octave, as above directed; and we have made use of a contrary motion, by making the octave descend from C to B, in the upper part, and ascend from C to D, in the bass, the fifth G still remaining in the same place: and this observation must be never lost sight of in composing; otherwise the composition will be full of errors, which is but too frequently and shamefully the case.

Let us proceed to the fourth bar. It's first quarter has D, it's second B, it's third D, it's fourth F. All these belong to the dominant, and therefore the chords belong to that fundamental, and are simple; for when the air is broken into divisions, the accompaniments either ought to be in unison with the melody, or simple; otherwise a confusion would evidently ensue.

The fifth bar is taken from the chords of the dominant; the first quarter is F, since the other three notes are only *passing*, and for the sake of elegance; the second quarter D, the third B, the fourth G; all belonging to it, and the accompaniments are the same; the second octave being a passing note of the same nature with the air.

The fifth bar seems to be a dissonance, the two upper notes belonging to the dominant, and that of the bass to the key; but if attentively considered, it will be found to be nothing more than a suspension of the harmony.

In the seventh bar the two first quarters belong to the key; so do also the two following quarters; but I thought it proper, in order to improve the air of the bass, to make it pass to the melody belonging to A, the relative minor. And thus it may be nearly seen how the theory is unfolded and exemplified in practice.

The eighth bar, during the two first quarters, belongs to the subdominant; but the second quarter, makes it belong to the relative minor of the same, both to avoid the octave in the accompaniment, and to make the air better.

The remaining bars of the first part of the solfeggio, pass into the dominant, and it there constitutes itself the key, in the manner we have directed in the descending scale. Let all these bars be examined fourth by fourth; and we shall find to what fundamentals they belong, and that they are always accompanied with the harmonics of their respective *places*.

Examine the 28th bar, where the second part resumes the *subject*, and it will be found that all this belongs to the fundamental G, with it's proper accompaniments.

In the phrase of the 29th bar, the progression of G, is contradicted, by the natural on F, and it proceeds to make a cadence in the key C; but this cadence is interrupted: and as we have said that the third E may belong to the dominant of the relative A, as it's octave, it here assumes that office, and then constitutes the relative A as the key.

It is needless for me to pursue this enquiry further, as every one will now be in a condition to perform this necessary exercise; I mean, to discover to which of the *harmonic places* every quarter of a bar, of any given melody, belongs; and to be able to add the harmonics suitable to it.

It is necessary, however, to make some observation on the second solfeggio. This is written in slow time, that is to say, that every bar is composed of eight distinct accented parts, or times; but in order not to multiply the times of a bar, it is beat slow, including two *times* or accented parts, in each quarter of the bar. When a melody is composed in this manner, it is necessary that every eighth part of the bar, which contains an equal portion of time, with a fourth part in the first solfeggio, be accompanied with the harmonics suitable to it; and in this case the *passing* or unaccented *notes* will be the sixteenths or semiquavers, as may be observed in the present solfeggio.

It must be further observed, first, that the first bar of the *air*, consists of one note held out for a long time, and consequently neither modulates, nor makes any phrase of itself; and it is therefore necessary to make the accompaniments modulate, as may be seen in this bar. The first four quarters of the upper accompaniments are harmonics of the key; the fifth a rest, the sixth, of the key, the seventh, of the subdominant, (and on this occasion the melody also is in the subdominant), and the eighth, of the key. And thus movement and colour, as it were, is given to the melody, which has none in itself.

Secondly, in the eleventh bar of this solfeggio, the harmonics are broken into divisions. Here A, is become the key, and its chords will be C E A. Whether these harmonics are held out their just length as entire notes, or are broken into smaller portions of time, it is evident they will have the same effect of perfecting the air. But when the melody is interrupted, and does not form itself into phrases, it is necessary to give it animation and variety, by divisions of the harmonics; and such divisions may moreover contain passing notes.

What has been said in this chapter will suffice to find out to what fundamental or harmonic place, every individual sound that can be used in melody, may be referred, and to know at the first glance, what chords are suitable to it; and this is the object of the composition of harmony.

The further extension and practical minutenesses of this art, will be easily acquired by the learner, in examining different scores of the compositions of the best masters. By the light of my principles he will see the reason of their practice, and thus his progress will be rapid, clear, and solid.

In going over these scores, he will meet with a stile called the *chromatic*, that is, when the melody ascends or descends by a succession of *semi-tones*. I apprise him of this that he may not be surprised at any thing; but I am well assured, that he will have no sooner observed and tried this stile, than he will be shocked at it. I must grant however that as far as the first five or six bars (see No. 16) it has a good effect; and being so far perfectly regular, it cannot be otherwise. It does not prepare or enter into any keys, but what are consistent and natural, according to the rules above laid down; but at the instant, that it proceeds beyond this, I cannot help being shocked at it myself. To proceed constantly by semi-tones, to ascend after the flat, and descend after the sharp, to leap from one key into another, without preparation, or connection, are things, which, being equally in opposition to nature, as to reason and good taste, must give an insufferable monotony to the melody, and disgust those who hear it. But this is what has been called "the great and learned stile"—So learned indeed as to be equally incomprehensible to the composer himself, as to the hearer.

Having mentioned stile, it will be proper to say a few words concerning it, before I conclude this chapter. The distinguishing character of a composition, or of the execution of it, is called *Stile*. This character varies greatly according to the dispositions and taste of people; and the genius of composers.

Every nation, like every individual, judges favorably of itself: all think advantageously of their customs, their taste, and stile; even those who have the least title to it. In this uncertainty then, what is to be done, in order to make a proper choice? I answer, that we ought in the first place, to look for the models of a proper stile to be followed, among those who apply themselves most to the study of the art: nor is this enough, we must moreover collect the opinion of the public, that is, of all nations; and single out those compositions of music which have been heard with rapture by almost every nation. Such are the compositions we must set before us as models of a good stile, to be imitated, or surpassed.

When a melody, or subject, passes successively and alternately from one part to the other, and is constantly repeated in all the keys into which the composition modulates; it is called a *Fugue*. When the parts, setting off one after the other, each repeat the same air, it is called a *Canon*.

I do not think it necessary to speak more particularly of these species of composition. Let the most approved pieces of this nature be examined, and their peculiar character will be soon known. The means, and ordinary rules already established, by experience and by reason, must be observed in treating them.

This is all that can be said on the subject of the composition of harmony; and any objects of less importance, will be acquired in practice, by the study and imitation of proper compositions, as I have already mentioned.

PART III. OF THE EXECUTION OF MUSIC.

CHAPTER VIII.

Of Vocal Music.

TO become good musicians, we ought to know the nature of vocal music; but I do not mean to say, that to become such, it is necessary that every good musician should sing well; being sufficiently apprized that the requisites for good singing are but seldom to be met with, and that
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with weak lungs, and an inflexible organ, it is scarcely possible. I mean only to observe that every good musician ought to be in a condition of rendering any piece of vocal music, if his command of voice, be answerable to his will and his knowledge of music. Let us see what the different operations are that a musician ought to be able to perform, before he can execute a piece of instrumental music.

He must comprehend the ideas which the composer, by means of notes, &c. has committed to writing; he must feel them, and make them his own, and then execute them faithfully, and with accuracy, on his instrument.

The execution therefore only holds the last place in this operation, and the ability of seizing, and entering into the composer's ideas, the first. This ability is only acquired by the habit of singing. It is certain that the sounds which proceed from our own feelings, and over which the will has the greatest command, are susceptible of the greatest perfection, and can alone express our passions with truth and energy. I will explain myself. Sounds of percussion, like those of the harpsichord, harp, &c. are the most imperfect that are used in music; because of their momentary duration, and escape from the power of the artist, as soon as they are formed: he has no longer the means of giving them any modification, or degree of perfection. The sounds of the violin, violoncello, &c. may be made more perfect; they remain under the will of the artist, who can, by his power of weakening and strengthening them, give them elegance, grace, and expression.

The sounds of the voice, which is the instrument of the singer, may certainly acquire every possible perfection; being the strongest expressions of the emotions of his soul, he has every power over them, and can diversify their character at his will. Moreover, accent is no more than a succession of the sounds of the human voice, and it is this succession that expresses the state of the mind. Now song, being but accent brought to perfection by art, must be the most fitted to give to our passions their true expression, and if I may so express myself, to exhibit the physiognomy, that is peculiar to them. The habit of singing therefore leads us to that of comprehending the ideas of the composer; and if the latter wishes to make good music, he must possess the art of imitation, which is no more than a good melody suitable to the subject he treats: it is extremely essential then, that he should have a thorough knowledge of the riches and resources of the art, before he begins to compose.

It is true that musicians of the greatest celebrity have been formed without the assistance of the method I mean to establish. But who can, undismayed, contemplate the length and intricacy of the road which has led them to that perfection? What time has there been consumed, what painful efforts, in surmounting obstacles that obstruct the progress of genius itself! Nor can we consider these great names, to be other than prodigies; not the disciples of art, but the pupils of nature: and if both had concurred in forming them, they must have arrived at such a high degree of eminence, as would be truly astonishing. We can never know the utmost limits of the capacity of men, unless they have the advantage of being instructed in the most solid, true, and easiest manner.

I have been struck with wonder whenever I have considered that neither artists, nor amateurs, have conceived the necessity of beginning the study of music, with that of singing. This want of reflection can only proceed from the two following causes. The amateurs have all along, thought they had taken the shortest and easiest road, whilst they have in fact chosen the most difficult and uncertain; and excepting in a very few instances, they furnish, an evident proof, in themselves, of this truth. How does it happen, that they can never dispense with the assistance of a master? It is not because they are wanting in execution, as, in general, they have enough; but it is because they have not learnt to decypher the musical ideas. The artists on the other hand, have been equally deceived; they ought to have perceived, that, having acquired the facility of executing notes, sooner than that of comprehending and expressing ideas, it is the want of the latter that most commonly stops them in their progress, and prevents their sooner reaping the fruits of their labour.

Both have been deceived by the experience of what occurs daily; they have observed that the art of singing required infinite time and pains, and they have accordingly ranked it in a separate class, with which they were to have no concern; and consigned it to professed singers only. This would

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never have happened, if they could have discovered that the art of singing is only long and painful, because the method by which it is taught, is imperfect; and that the principles by which it has been supported, are contradictory, and destructive of themselves.

But having alleged the imperfection of the ordinary method I shall present one to the reader that is sufficiently simple; on the principles of our system.

I begin by giving a name to each of the seven intervals of which the diatonic scale is composed; namely, *do, re, mi, fa, sol, la, si*. After which *do* may be repeated for the eight, the beginning of another series; followed by the remaining syllables, and repeated at pleasure.

Do is called the first of the key, *re* the second of the key, *mi* the third, *fa* the fourth, *sol* the fifth, *la* the sixth, *si* the seventh, and afterwards *do*, the eighth. These names must be well learnt in ascending and descending the scale by single degrees, and afterwards by larger intervals or leaps; repeating, first of the key *do*, third of the key *mi*, seventh of the key *si*, &c. and so, in this irregular manner, of the others; and when this practice shall have become familiar to the learner, he will then examine the relations of these names and degrees with the lines and spaces used in music.

He will find the scale or gammut (No. 4) in the clef of C, on the first line, which is that of the *soprano*, and he will reason in this manner: I find no alteration of notes on the clef, that is, neither sharps nor flats; the key is therefore natural, and it is that of C, which is on the first line. Now the scale must be placed from C, on the first line, to it's octave, on the fourth space: saying, the first or key note is on the first line, and is called *do*; the second of the key is placed in the first space, and is called *re*; the third of the key is on the second line, and is called *mi*; and so of the others.

In the scale (No. 5) he will find a flat; it serves to form the progression of the key of F, as we have formerly mentioned; F, in the *soprano* clef, is in the second space; thence, he will begin his gammut, saying; the first or key note is in the second space, and is called *do*; the second of the key is on the third line, and is called *re*; and so of the others, to the octave, which is on the first *leger line*. (By *leger lines* is understood, those which are drawn occasionally, above or below the five ordinary lines.) And from the octave, he may begin again another series if necessary.

He must learn to read these scales well, before he proceed to their intonation, and cannot well dispense with practising them together with another voice, as they are written, or with a piano forte.

In beginning to sing the first of the key *do*, the mouth must be put in a *smiling* but natural form: it will be the means of giving more pureness and perfection to the sound of the voice, and a sufficient reason will be given for it in the sequel.

Acquire the habit of swelling the voice: it must pass through five different degrees; from *pianissimo*, to *piano*, to *parlante*, to *forte* and *fortissimo*; and this being done, it must return by the same degrees to *pianissimo*, in a retrograde order.

Of the *do* of the gammut, which must last a whole bar, the first quarter must be sung *pianissimo*, the second *piano*, the third *parlante*, the fourth *forte*, and the first fourth of *re*, *fortissimo*. Here the voice must begin to diminish gradually; and the second fourth of *re* must be sung *forte*, the third fourth *parlante*, the fourth quarter *piano*, and the first of *mi*, *pianissimo*, continuing this exercise on all the gammut.

The learner must be also accustomed to make this *mezza di voce* or swell, on any note that may occur, and to prolong it's duration at pleasure.

As soon as this exercise is become familiar, he must learn to slide, or drag the voice; he will find a small note, which expresses by it's value, the portion which he ought to take from *do*, to be transferred to *re*, and so of the others successively.

This *port de voix* takes place even on notes, which go by leaps, (see the second part of the gammut); and is necessary to preserve the shades, and the connection of the sounds of which melody is composed. To prepare the auditor for the note which is to follow, it is necessary to introduce him insensibly into it, for fear of shocking a delicate ear.

You will find a comma above *re*; this is the proper time of taking breath, but the last quarter of *re*, must however be heard; you may then take breath, leaving the remaining part of the note. It is difficult to express in writing all the delicacy of these shades; it can scarcely be done by speech itself.

When the intonation of the notes is learned, with the precision we have observed, the accustomed practice of the gammuts with the names of the notes, must be resumed, and continued several times with the word *amen*. The vowels *a* and *e* (pronounced *aw*, *ay*,) are best fitted to give the most natural pureness to sounds. This being done, the learner must pursue his practice, as follows. Let him sound on the *piano forte*, the three *harmonic places*, with their *concorde*s, and accustom himself to repeat all the sounds of the respective *concorde*s to the three harmonic places. Follow No. 8; and it is of little consequence, in this practice, to keep time.

I shall now support by principle, and submit to the test of reason, what I have hitherto said on the subject of vocal music. I have above directed the syllabic names I have given to the natural scale, to be transposed without alteration, to the gammut of every other key, as may be observed in the second gammut of the key of F. No. 5. But the ordinary method of teaching to read music, is altogether different, and contradictory to itself.

Men, in order to communicate to one another their ideas, have very ingeniously established articulated exterior signs; that is to say, words which are representative of things. By this intimate relation of the thing with the word that represents it, the idea of the thing is excited in our mind, as soon as we see the word, or hear it pronounced. Now the first notions that a learner of singing acquires, is that the interval of an *entire tone* is represented by the signs *do re*, and *re mi*; and that of a semi-tone by *mi fa*.

After having contracted this habit in singing the scale of C, let us suppose the scholar to pass into the key of D. The gammut of that key, according to the common practice, at least in France, will begin by *re*, and it's progression will be as follows: the *entire tone*, will be represented by the signs *re* and *mi*, *mi* and *fa*, and the semi-tone by *fa* and *sol*, &c. and hence a manifest contradiction. In the first gammut the semi-tone was represented by *mi* and *fa*; the entire tone by *fa* and *sol*; and in the second gammut, the entire tone is represented by *mi* and *fa*, and the semi-tone by *fa* and *sol*; that is to say, that the habit acquired by the first gammut, forms an obstacle to the progress of the second; and the habit of the latter destroys that of the former. Now, if we begin every key by *do*, it will be found that the syllables *mi* and *fa*, *fi* and *do*, will invariably represent the semi-tones, and all the others, the entire tones.

Further, what will give a preference to this method, is that the syllable *mi* expresses the third, naturally acute, of C the key, the syllable *fi*, expresses the third, naturally acute, of G the dominant. Nor must it be imagined that the vowel *i* has been made use of at random, to express these two acute thirds; the sound of this vowel, (as pronounced by foreigners like *ee*; that is, *mi* and *fi* must be pronounced *mee*, and *fee*,) will oblige the tongue, to close in a small degree, the passage of the voice, and consequently to make it naturally acute. Now, substitute continually, according to the ordinary method, to this vowel, others more open, it is certain the intonation will suffer by it; and the bad habit thereby acquired, cannot be got rid of, but with extreme difficulty.

Again, what advantage will there not be derived by this method in transposition? Let the harpsichord or orchestra play a piece of music, higher or lower; the learner, according to this method, will sing always with the same exactness and facility.

I have called *do* the first of the key, *re* the second, &c. A considerable advantage will be derived to the learner, from this practice, when he comes to execute a figured bass, which is not indeed marked with these syllabic words *do*, *re*, &c. but with numbers. Thus to express the *concorde*s of the subdominant, he will never find *la*, *do*, *fa*; but 3, 5, 8. Now, by being accustomed to know the chords by the numerical signs, he will, at the same time, be rendering figured or thorough bass, and the reading of a score, familiar to himself.

I have directed the mouth to be put into a smiling form, and part of the teeth to be discovered; for that position will be found the most favourable for the formation of a pure and *harmonious* voice. The air, impelled by the lungs, is forced through the *glottis*, which we can contract or dilate at pleasure: and thus modified, is in a state of producing sound, or voice; which, being further corrected in the vaulted passage of the palate, (where the harmonics find time and every advantage of being formed) comes at length to pass through the passage, solidly fixed by the two rows of teeth, without having it's figure changed, and is heard in the most advantageous manner. I say solidly
fixed

fixed by the two rows of teeth; because if the air should meet any thing to affect it's motion, the voice would be also affected and changed, which always happens to those, who want any of their fore-teeth; their voice becomes whistling and disagreeable. And by the same reasoning, it is evident, that if the air, on issuing from the palate, strikes against the lips, it must suffer from their soft reaction, and acquire a dullness in it's sound, which will be always avoided, by drawing the lips on the teeth, as is done in laughing.

I have said that it was necessary to practice the gammut with the accompaniments, and with a second voice. That is the only means of forming the voice, and giving it steadiness, and of acquiring an intonation, or tune, that will be just, sure, and unshaken. I can say, from experience, that pupils, instructed in this manner, arrive at singing at once in an orchestra, without being any ways deranged, or embarrassed, by the shock of the instruments: they are also able to sing, equally well, either the first or second part; which never happens, or at least very rarely, with those who have been only instructed and accompanied by an instrument in unison with the voice, without harmony.

We may now proceed to the practice and study of the *mutations*. By this word is to be understood, the transition that the melody makes, when it relinquishes one key, to go into another: in that case, the diatonic scale, *do, re, mi, &c.* must be applied to the new key entered into. For this purpose the learner may practise the *Solfeggio*. (No. 1.) It is composed in the key of C, and it passes into that of the dominant G: this *transition* must be foreseen in reading, some little time, before the new modulation takes place. To facilitate the practice of this to the learner, he will find, that whenever the key is changed in this *solfeggio*, that the names are marked over the notes in the proper manner. He must afterwards observe the same rule in every piece of music; that is to say; every key note into which the modulation may lead, must be called *do*, and so of the others.

He will also find, marked on some of the penultimate notes of the cadence in this *solfeggio*, the two letters *tr*, which point out a *trillo*, or shake, to be made on the note. The *shake* is composed of an entire tone, in the major keys, namely, of *re* and *mi*; and of a semitone in the minor keys, namely, *mi*, and *fa*. In each case, both the notes must be struck with the greatest possible quickness, perfectly in tune, and with the greatest precision. The shake may be acquired, if pains are taken at first, by singing and pronouncing the names of the two notes which compose it, in a slow manner, increasing the movement afterwards by degrees; and when the movement is nearly increased to *presto*, the names of the notes are not to be used, but the vowel *a*, of the word *amen*, (pronounced *aw*) substituted in their place. (See No. 6) And it is to be observed that all these operations ought to be performed, severally, without taking breath.

There will be also found in the *solfeggio*, certain *turns*, or *mordenti*, which are pointed out by a mark something like the letter *m*; and some small *passing notes*, which are used, to fill up the spaces that separate the notes, in order to make the melody more united and natural; but all these graces and expressions being marked, with sufficient clearness, in small characters, the learner will have only to follow them accurately.

The proper places for breathing, are marked by a comma; I have before given some directions with respect to the manner of taking breath, and have now only to add in general, that a phrase must not be broken or dismembered by breathing, and even at the end of phrases, it must be done in such a manner as not to be perceived.

As it is necessary for the learner, to pronounce the names of the notes in singing, in order to be assured of the intonation; he must practise this *solfeggio* at first in a slow and convenient movement, that this may be done without mistake and without difficulty; after which it may be sung *allegro*, with the word *amen*; and lastly, it may be sung *presto*, to habituate the voice to flexibility.

If the learner is desirous of cultivating any musical instrument of art, he will attain it with certainty, by observing the rules before laid down. The same practice must be followed on the instrument, as was done on the voice; the beauty and richness of its tone must be formed by practising the gammuts, in every key, with the swell or *mezza di voce*, crescendo and diminuendo, and the graces or *ports de voix*, mentioned above. And afterwards *solfeggio* and airs must be practised, in following the method directed in the practice of singing. Nothing will then remain to arrive at perfection, but to acquire the necessary facility of execution, which will be given by practice and use.

But particular attention must be paid to every thing that has been said; nor must those things which may appear to the learner to be of less importance than others; whether in the theory or practice, be passed over superficially. Experience will then convince him, that our method is sufficient to instruct him, successfully, in vocal and instrumental music, and to conduct him insensibly, but with certainty, to the greatest degree of perfection.

C H A P. IX.

Of Thorough Bass.

By thorough bass, is understood, the manner and the rules of accompanying song, or other pieces of music; that is to say, to unite to the bass, the harmonics, which are suitable to the part containing the melody. This will be attained by putting in practice all that we have said concerning the composition of harmony; as by these means the accompanier will be in a condition of seeing into the construction of the composition, which will greatly facilitate his performance. What further remains to be pointed out to the learner's attention for the knowledge of thorough bass, are only the following particulars.

With respect to cadences (See No. 17.) they are distinguished by three different positions. When the melody terminates on the octave, the cadence is of the *first position*; when it is on the third, the cadence is of the *second position*; and when it happens on the fifth, the cadence is of the *third position*.

Now as in accompaniment, the part containing the song or melody, is commonly to be followed, without however playing it; and the beginning of any phrase of a cadence, being necessarily in one or other of these three positions, it is evident, that the performer of thorough bass, who shall have practised the three cadences (No. 17.) in every key, will be prepared for every sort of cadence possible, without fear of falling into the mistake of making fifths or octaves in succession.

There will remain therefore, nothing more necessary for the instruction of the student of accompaniment, than to point out a method to carry into practice what we have said above, and in the treatise on composition.

He must practise the harmonic scale in every key. That is, he must practise the first scale of C, No. 11, in D, and in E; and that of F, No. 12, will serve as guide to him for G, A, and B. It is necessary that he should know the scales in this order; because when a figured bass is to be played without the score, the extension of the song or melody cannot be known; in which case, it will be necessary to keep the harmony united, and concentrated, as it is done in these two scales. But when the performer can derive his accompaniment, from the inspection of the score; then he can follow the part of the *canto* or song, according to the spirit and nature of the other accompaniments; and by that means, the thorough bass will always be more clear, elegant, natural and agreeable.

After the practice of all the scales, and cadences possible, it will be necessary to render familiar to himself the manner of passing into all the *relative* keys, as in No. 14. He will then be able to transpose this practice, and this same example, into any other key.

When these three objects have become familiar to him, with the observations that are to be found in the treatise on composition; he may be pronounced able to accompany. Is it not true that the method of solfa-ing has given him that of reading a score? This practice then, will give him the whole manner of executing it.

Finally, it is evident that this part of the execution of music, depends immediately upon, and is derived from the second part, which treats of practical composition; and this second part is only a just and legitimate consequence of the principles established in the first part, and of the corollaries or inferences deducible from them. And I may venture to assert, that all the different operations of music, being found in these two last parts, I have accomplished what I had proposed to myself, and what was requisite to draw the art of music out of that mystery and confusion to which it had so long been consigned.

F I N I S.



Solfeggio

1

Allegro

Nº 1.

First system of musical notation. The top staff is in treble clef with a common time signature. The middle staff is in treble clef with a common time signature and contains the lyrics "Sol do do re mi" under the notes "Sol", "do", "do", "re", and "mi". The bottom staff is in bass clef with a common time signature. There are first and third fingerings indicated above the middle staff, and an asterisk above a group of notes. The word "men, A" is written below the middle staff.

Second system of musical notation. The top staff is in treble clef with a common time signature. The middle staff is in treble clef with a common time signature and contains the lyrics "men, A" under the notes. The bottom staff is in bass clef with a common time signature. There are second and third fingerings indicated above the middle staff, and an asterisk above a group of notes. The word "men," is written below the middle staff.

Third system of musical notation. The top staff is in treble clef with a common time signature. The middle staff is in treble clef with a common time signature and contains the lyrics "la la fa mi fa sol fa mi fa do do" under the notes. The bottom staff is in bass clef with a common time signature. There are first and fourth fingerings indicated above the middle staff, and an asterisk above a group of notes. The word "men, A" is written below the middle staff.

Fourth system of musical notation. The top staff is in treble clef with a common time signature. The middle staff is in treble clef with a common time signature and contains the lyrics "men, A" under the notes. The bottom staff is in bass clef with a common time signature. There are first and second fingerings indicated above the middle staff, and an asterisk above a group of notes. The word "men, A" is written below the middle staff.

8 9

men. A

10 11

men. A fo do do re mi do fol fa mi mi men. A

12 13

men. A men. A

14 15 16

fa re re re do men. A



17

men, A men, A

Detailed description: This system contains measures 17 and 18. The top staff is a treble clef with a key signature of one flat (B-flat). Measure 17 features a melodic line with eighth and sixteenth notes. Measure 18 continues this melody. The middle staff is a piano accompaniment with a key signature of one flat, featuring a series of sixteenth-note chords. The bottom staff is a bass clef with a key signature of one flat, featuring a series of half notes. The lyrics 'men, A men, A' are written below the middle staff, with 'A' appearing under measures 17 and 18.

18 19

men, A do men, do A

Detailed description: This system contains measures 19 and 20. The top staff is a treble clef with a key signature of one flat. Measure 19 features a melodic line with eighth and sixteenth notes. Measure 20 continues this melody. The middle staff is a piano accompaniment with a key signature of one flat, featuring a series of sixteenth-note chords. The bottom staff is a bass clef with a key signature of one flat, featuring a series of half notes. The lyrics 'men, A do men, do A' are written below the middle staff, with 'A' appearing under measures 19 and 20.

20 21 22

men, fol fol la fi mi fol men, A men,

Detailed description: This system contains measures 21 and 22. The top staff is a treble clef with a key signature of one flat. Measure 21 features a melodic line with eighth and sixteenth notes. Measure 22 continues this melody. The middle staff is a piano accompaniment with a key signature of one flat, featuring a series of sixteenth-note chords. The bottom staff is a bass clef with a key signature of one flat, featuring a series of half notes. The lyrics 'men, fol fol la fi mi fol men, A men,' are written below the middle staff, with 'A' appearing under measures 21 and 22.

23 24

A men.

Detailed description: This system contains measures 23 and 24. The top staff is a treble clef with a key signature of one flat. Measure 23 features a melodic line with eighth and sixteenth notes. Measure 24 continues this melody. The middle staff is a piano accompaniment with a key signature of one flat, featuring a series of sixteenth-note chords. The bottom staff is a bass clef with a key signature of one flat, featuring a series of half notes. The lyrics 'A men.' are written below the middle staff, with 'A' appearing under measures 23 and 24.

Solfeggio

Nº 2.

Largo

This musical score is for a piece titled "Solfeggio No. 2" in a "Largo" tempo. It is written for a piano and a vocal line. The key signature has one sharp (F#), and the time signature is common time (C). The score is divided into four systems, each with a piano part (left) and a vocal part (right). The piano part features a steady bass line with occasional chords and moving lines. The vocal part is more melodic and includes various ornaments and techniques marked with asterisks (*), slurs, and fingerings (1, 2, 3, 4, 5, 6, 7, 8). The first system includes a "1" marking above the vocal line. The second system includes a "2" marking below the piano part and a "3" marking above the vocal part. The third system includes a "4" marking above the piano part, a "5" marking above the vocal part, and a "6" marking above the piano part. The fourth system includes a "7" marking above the piano part, a "3" marking above the vocal part, and an "8" marking above the piano part. The score concludes with a final cadence in the piano part.



First system of musical notation. The top staff is in treble clef with a key signature of one sharp (F#). The bottom staff is in bass clef with a key signature of one sharp (F#). The system contains measures 9, 10, and 11. Measure 10 is marked with an asterisk (*). Measure 11 has a triplet of eighth notes.



Second system of musical notation. The top staff is in treble clef with a key signature of one sharp (F#). The bottom staff is in bass clef with a key signature of one sharp (F#). The system contains measures 12 and 13. Measure 13 is marked with an asterisk (*). Measure 13 contains a triplet of eighth notes.



Third system of musical notation. The top staff is in treble clef with a key signature of one sharp (F#). The bottom staff is in bass clef with a key signature of one sharp (F#). The system contains measures 14, 15, and 16. Measure 14 is marked with an asterisk (*). Measure 15 is marked with an asterisk (*). Measure 16 is marked with an asterisk (*). Measure 15 contains a triplet of eighth notes.



Fourth system of musical notation. The top staff is in treble clef with a key signature of one sharp (F#). The bottom staff is in bass clef with a key signature of one sharp (F#). The system contains measures 17, 18, and 19. Measure 17 is marked with an asterisk (*). Measure 18 is marked with an asterisk (*). Measure 19 is marked with an asterisk (*). Measure 18 contains a triplet of eighth notes.

Nº 4.

First system of musical notation for 'Nº 4'. It consists of four staves. The top staff is a treble clef with a C-clef, containing a melody with eighth and sixteenth notes. The second staff is a bass clef with a C-clef, containing a melody with quarter and half notes. The third staff is a bass clef with a C-clef, containing a melody with quarter and half notes, with the lyrics 'Do re mi fa fol la' written below it. The fourth staff is a bass clef with a C-clef, containing a melody with eighth and sixteenth notes.

Do re mi fa fol la

Second system of musical notation for 'Nº 4'. It consists of four staves. The top staff is a treble clef with a C-clef, containing a melody with eighth and sixteenth notes. The second staff is a bass clef with a C-clef, containing a melody with quarter and half notes. The third staff is a bass clef with a C-clef, containing a melody with quarter and half notes, with the lyrics 'fi do do fi la' written below it. The fourth staff is a bass clef with a C-clef, containing a melody with eighth and sixteenth notes.

fi do do fi la

Third system of musical notation for 'Nº 4'. It consists of four staves. The top staff is a treble clef with a C-clef, containing a melody with eighth and sixteenth notes. The second staff is a bass clef with a C-clef, containing a melody with quarter and half notes. The third staff is a bass clef with a C-clef, containing a melody with quarter and half notes, with the lyrics 'fol fa mi re do' written below it. The fourth staff is a bass clef with a C-clef, containing a melody with eighth and sixteenth notes.

fol fa mi re do

Nº 5.

Do re

Sol mi

fi re mi fi

Nº 6.

remire A - - - - - men.

Nº 7.

Prepared Perfect Cadence.

Direct Cadence. Inverted Cadence.

Semi Cadence.

Imperfect Cadence. Imperfect Cadence. Interrupted Cadence.

Interrupted Cadence.

Suspended Cadence.

Nº 8.

Perfect Cadence. Prepared Perfect Cadence.

Nº 9.

Nº 10.

8

Direct Cad:

Imp[†] Cad: Imp[†] Cad: Interrupted Cadence.

Semi Cad:

Interrupted Cad:

Suspended Cad:



Nº11.



Nº12.



Nº13.



Nº14.



